



HYDRASYNTH

MIDI NRPN & CC Communication Spec

Firmware v1.5



Basic Information		Transmitted	Received	Remarks
MIDI Channels		1-16	Omni, 1-16	
Note Numbers		0-127	0-127	
Program Change		Yes	Yes	Enabled in System
Bank Select		Yes	Yes	
Note On velocity		Yes	Yes	
Note Off velocity		No	Yes *	Via MPE, not supported in hardware.
Channel Aftertouch		Yes	Yes	Aftertouch preference is set in System page
Polyphonic Aftertouch		Yes	Yes	
Pitch Bend		Yes	Yes	On pitch wheel
Sysex		Yes *	Yes*	For sending patches between two Hydrasynths
MIDI Clock		Yes – INT RUN mode only	Yes	Internal, USB, MIDI
MPE		Yes	Yes	Enabled in System page
NRPN		Yes	Yes	Full spec below. Most engine parameters can be controlled via NRPN's
Message	MIDI CC			
Bank Select MSB	00	Yes	Yes	Value 0 is sent; value is ignored on input
Modulation Wheel	01	Yes	Yes	
Expression	11	Yes	Yes	
Bank Select LSB	32	Yes	Yes	Range is 0 to 4
Sustain Pedal	64	Yes	Yes	
All Notes Off	123	Yes	Yes	

MIDI NRPN SPECIFICATION

Category	Parameter	CC Dec	CC Hex	NRPN MSB	NRPN LSB	VV, WW if no extra comment, then param value = VV * 128 + WW. The default param value range is [0 - 2000H].
OSC	All OSC Cent			41H	04H	
	OSC Mode			3FH	18H	when VV=00H ,set OSC1 Mode, when VV=01H ,set OSC2 Mode, when VV=02H ,set OSC3 Mode, WW = [0,1] = Single / WaveScan
	semi			3FH	11H	when VV=00H ,set OSC1 Semi, when VV=01H ,set OSC2 Semi, when VV=02H ,set OSC3 Semi, when WW > 64,semi = WW - 128. when WW <= 64,semi = WW .
OSC1	OSC1 Type			3FH	19H	VV*128+WW = [0,218]
	OSC1 Cent	111	6F	41H	01H	when VV*128+WW > 4096,Cent = VV*128+W - 8192. when VV*128+WW <= 4096,Cent = VV*128+W .
	OSC1 Keytrack			3FH	54H	VV*128+WW = [0,200]
	OSC1 WavScan	24	18	41H	2AH	
	solo OSC1 wavscan			3FH	1bH	VV = [0,7] means OSC1 wav1 to wav8, WW = [0,1] = Off / On
	OSC1 WaveScan Wav1			3FH	60H	VV*128+WW = [0,218]
	OSC1 WaveScan Wav2			3FH	61H	VV*128+WW = [0,218]
	OSC1 WaveScan Wav3			3FH	62H	VV*128+WW = [0,218]
	OSC1 WaveScan Wav4			3FH	63H	VV*128+WW = [0,218]
	OSC1 WaveScan Wav5			3FH	64H	VV*128+WW = [0,218]
	OSC1			3FH	65H	VV*128+WW = [0,218]

	Wav6					
	OSC1 WaveScan Wav7			3FH	66H	VV*128+WW = [0,218]
	OSC1 WaveScan Wav8			3FH	67H	VV*128+WW = [0,218]
OSC2	OSC2 Type			3FH	1AH	VV*128+WW = [0,218]
	OSC2 Cent	112	70	41H	02H	when VV*128+WW > 4096,Cent = VV*128+W - 8192. when VV*128+WW <= 4096,Cent = VV*128+W .
	OSC2 Keytrack			3FH	55H	VV*128+WW = [0,200]
	OSC2 WavScan	26	1A	41H	2BH	
	solo OSC2 wavscan			3FH	1cH	VV = [0,7] means OSC2 wav1 to wav8, WW = [0,1] = Off / On
	OSC2 WaveScan Wav1			3FH	68H	VV*128+WW = [0,218]
	OSC2 WaveScan Wav2			3FH	69H	VV*128+WW = [0,218]
	OSC2 WaveScan Wav3			3FH	6AH	VV*128+WW = [0,218]
	OSC2 WaveScan Wav4			3FH	6BH	VV*128+WW = [0,218]
	OSC2 WaveScan Wav5			3FH	6CH	VV*128+WW = [0,218]
	OSC2 WaveScan Wav6			3FH	6DH	VV*128+WW = [0,218]
	OSC2 WaveScan Wav7			3FH	6EH	VV*128+WW = [0,218]
	OSC2 WaveScan Wav8			3FH	6FH	VV*128+WW = [0,218]
OSC3	OSC3 Type			3FH	0DH	VV*128+WW = [0,218]
	OSC3 Cent	113	71	41H	03H	when VV*128+WW > 4096,Cent = VV*128+W - 8192. when VV*128+WW <= 4096,Cent = VV*128+W .
	OSC3			3FH	56H	VV*128+WW = [0,200]

	Keytrack					
Mutator	Mutator Mode			3FH	21H	VV = [0,3] means MUTATOR 1-4 WW = [0,7] means FM-Lin (FM) / WavStack (Detune) / OSC Sync (Sync) / PW-Orig (PW) / PW-Sqeez (squeeze) / PW-ASM (custom) / Harmonic / PhazDiff
	Mutator Sources (FM-Lin)			3FH	24H	VV = [0,3] means MUTATOR 1-4 WW = [0,12] means Sine / Triangle / OSC1 / OSC2 / OSC3 / RingMod / Noise / Mutator1 / Mutator2 / Mutator3 / Mutator4 /Mod in 1 / Mod in 2
	Mutator Sources (OSC Sync)			3FH	22H	VV = [0,3] means MUTATOR 1-4 WW = [0,2] means OSC1 / OSC2 / OSC3
Mutator1	Mutator1 Ratio	29	1D	41H	2CH	
	Mutator1 Depth	30	1E	40H	1FH	
	Mutator1 Dry/Wet	31	1F	40H	22H	
	Mutator1 Fdbk			40H	25H	
	Mutator1 window			40H	1CH	
	Mutator1 Warp1			40H	60H	
	Mutator1 Warp2			40H	61H	
	Mutator1 Warp3			40H	62H	
	Mutator1 Warp4			40H	63H	
	Mutator1 Warp5			40H	64H	
	Mutator1 Warp6			40H	65H	
	Mutator1 Warp7			40H	66H	
	Mutator1 Warp8			40H	67H	
Mutator2	Mutator2 Ratio	33	21	41H	2DH	
	Mutator2 Depth	34	22	40H	20H	
	Mutator2 Dry/Wet	35	23	40H	23H	

	Mutator2 Fdbk			40H	26H	
	Mutator2 window			40H	1DH	
	Mutator2 Warp1			40H	68H	
	Mutator2 Warp2			40H	69H	
	Mutator2 Warp3			40H	6AH	
	Mutator2 Warp4			40H	6BH	
	Mutator2 Warp5			40H	6CH	
	Mutator2 Warp6			40H	6DH	
	Mutator2 Warp7			40H	6EH	
	Mutator2 Warp8			40H	6FH	
Mutator3	Mutator3 Ratio	36	24	41H	2EH	
	Mutator3 Depth	37	25	40H	21H	
	Mutator3 Dry/Wet	39	27	40H	24H	
	Mutator3 Fdbk			40H	27H	
	Mutator3 window			40H	1EH	
	Mutator3 Warp1			40H	70H	
	Mutator3 Warp2			40H	71H	
	Mutator3 Warp3			40H	72H	
	Mutator3 Warp4			40H	73H	
	Mutator3 Warp5			40H	74H	
	Mutator3 Warp6			40H	75H	
	Mutator3 Warp7			40H	76H	
	Mutator3			40H	77H	

	Warp8					
Mutator4	Mutator4 Ratio	40	28	41H	2FH	
	Mutator4 Depth	41	29	40H	16H	
	Mutator4 Dry/Wet	42	2A	40H	17H	
	Mutator4 Fdbk			40H	1BH	
	Mutator4 Window			40H	1AH	
	Mutator4 Warp1			40H	78H	
	Mutator4 Warp2			40H	79H	
	Mutator4 Warp3			40H	7AH	
	Mutator4 Warp4			40H	7BH	
	Mutator4 Warp5			40H	7CH	
	Mutator4 Warp6			40H	7DH	
	Mutator4 Warp7			40H	7EH	
	Mutator4 Warp8			40H	7FH	
Ring-Noise	Type of noise			3FH	27H	VV*128+WW = [0,6] means White/Pink/Brown/Red/Blue/Violet/Grey
	RM12 Depth	43	2B	40H	03H	
	Signal source for RM			3FH	26H	VV = [0,1] means source 1-2 WW = [0,9] means OSC1 / OSC2 / OSC3 / Noise / Mutator1 / Mutator2 / Mutator3 / Mutator4 / Mod in 1 / Mod in 2
Mix	MIXER SOLO			3FH	25H	VV*128+WW = [0,1] means OFF / ON
	OSC1 Vol	44	2C	40H	07H	
	OSC1 Pan	45	2D	40H	08H	
	OSC1 FRate	118	76	40H	31H	
	OSC2 Vol	46	2E	40H	09H	
	OSC2 Pan	47	2F	40H	0AH	
	OSC2 FRate	119	77	40H	32H	
	OSC3 Vol	48	30	40H	0BH	

	OSC3 Pan	49	31	40H	0CH	
	OSC3 FRate	114	72	40H	33H	
	Noise Vol	3	3	40H	0DH	
	Noise Pan	8	8	40H	0EH	
	Noise FRate	115	73	40H	34H	
	RM12 Vol	9	9	40H	01H	
	RM12 Pan	10	0A	40H	04H	
	RM12 FRate	116	74	40H	35H	
	Filter routing selector			3FH	2CH	VV*128+WW = [0,1] means Series / Parallel
Filter1	Filter1 Position of Drive			3FH	29H	VV*128+WW = [0,1] means Pre / Post
	Filter1 Cutoff	74	4A	40H	28H	
	Filter1 Drive	50	32	40H	2BH	
	Filter1 Res	71	47	40H	29H	
	Filter1 Special			40H	2AH	
	Filter1 Keytrack	51	33	41H	66H	
	Filter1 LFO1amt	52	34	41H	60H	
	Selects order of vowels			3FH	2EH	VV*128+WW = [0,7] means AEIOU / AIUEO / AUIOE / AOUIE / IOUAE / UEAOI / IOEAU / UIEAO
	Type of filter 1 model			3FH	28H	VV*128+WW = [0,10] means LP_LDR12 / LP_LDR24 / LP_FAT12 / LP_FAT24 / LP_GATE / LP_MS20 / HP_MS20 / LP_3_LER / BP_3_LER / HP_3_LER / VOWEL
	Filter1 Vel Env	53	35	41H	69H	
	Filter1 ENV1amt	54	36	41H	61H	
Filter2	Filter2 Position of Drive			3FH	2BH	VV*128+WW = [0,1] means Pre / Post
	Flt2 Cutoff	55	37	40H	2CH	
	Flt2 Res	56	38	40H	2DH	
	Flt2 Morph	57	39	40H	2EH	
	Filter2 Keytrack	58	3A	41H	67H	

	Filter2 LFO1amt	59	3B	41H	62H	
	Filter2 Vel Env	60	3C	41H	6AH	
	Filter2 ENV1amt	61	3D	41H	63H	
	Flt2 Type			3FH	23H	VV*128+WW = [0,1] means LP-BP-HP/LP-NO-HP
AMP	Amp Level			40H	02H	
	Amp Vel Env			41H	6BH	
	Amp LFO2amt	62	3E	41H	64H	
PRE-FX	PRE-FX type			3BH	7FH	
	PRE-FX preset			3BH	00H	depends on PRE-FX type
	PRE-FX Mix	93	5D	41H	6EH	
	PRE-FX Param1	12	0C	41H	6FH	
	PRE-FX Param2	13	0D	41H	70H	
	PRE-FX Param3			3BH	30H	depends on PRE-FX type
	PRE-FX Param4			3BH	40H	depends on PRE-FX type
	PRE-FX Param5			3BH	50H	depends on PRE-FX type
	Sidechn type(when PRE-FX type is compress)			3BH	73H	depends on PRE-FX type
Delay	Delay BPMsync			3BH	70H	VV*128+WW = [0,1] means OFF / ON
	Delay Dry/Wet	92	5C	41H	78H	
	Delay Feedback	14	0E	41H	75H	
	Delay FeedTone			41H	76H	
	Delay Time	15	0F	41H	74H	
	Delay Type			3BH	71H	VV*128+WW = [0,4] means BASIC / BASIC_ST / PANDELAY / LRCDELAY / REVERSE
	Delay Wet tone	63	3F	41H	77H	

Reverb	Reverb Dry/Wet	91	5B	41H	7EH	
	Reverb HiDamp			41H	7BH	
	Reverb LoDamp			41H	7CH	
	Reverb Predelay			41H	7DH	
	Reverb Time	65	41	41H	79H	
	Reverb Tone	67	43	41H	7AH	
	Reverb type			3CH	72H	VV*128+WW = [0,3] means HALL / ROOM / PLATE / CLOUD
POST-FX	POST-FX type			3CH	7FH	
	POST-FX preset			3CH	00H	depends on POST-FX type
	POST FX Mix	94	5E	41H	71H	
	POST-FX Param1	68	44	41H	72H	
	POST-FX Param2	69	45	41H	73H	
	POST-FX Param3			3CH	30H	depends on POST-FX type
	POST-FX Param4			3CH	40H	depends on POST-FX type
	POST-FX Param5			3CH	50H	depends on POST-FX type
	Sidechn type(when POST-FX type is compress)			3CH	73H	depends on POST-FX type
LFO1	LFO1 Gain	70	46	41H	0BH	
	LFO1 Wave			3FH	04H	VV=00H set Wave to WW
	LFO1 BMP Sync			3FH	04H	VV=01H set BPM Sync to WW
	LFO1 TrigSync			3FH	04H	VV=03H set TrigSync to WW
	LFO1 Smooth			3FH	04H	VV=06H set Smooth to WW
	LFO1 Steps			3FH	04H	VV=07H set Steps to WW
	LFO1 Delay(BPM Sync off)			3FH	04H	VV=11H set Delay to WW

	LFO1 Fadein(BPM Sync off)			3FH	04H	VV=12H set FadeIn to WW
	LFO1 Delay(BPM Sync on)			3FH	04H	VV=21H set Delay to WW
	LFO1 Fadein(BPM Sync on)			3FH	04H	VV=13H set FadeIn to WW
	LFO1 One- Shot			3FH	04H	VV=14H set One-Shot to WW
	LFO1 phase			3FH	30H	VV*128+WW = [0,360]
	LFO1 Rate	72	48	41H	05H	
	LFO1 Rate(BPM Sync on)			43H	05H	[Rhythm List (LFO Rate)]
	LFO1 step1 to step8			3AH	10H- 17H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
	LFO1 step9 to step64			4AH	00H- 37H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
LFO2	LFO2 Gain	28	1C	41H	0CH	
	LFO2 Wave			3FH	05H	VV=00H set Wave to WW
	LFO2 BMP Sync			3FH	05H	VV=01H set BPM Sync to WW
	LFO2 TrigSync			3FH	05H	VV=03H set TrigSync to WW
	LFO2 Smooth			3FH	05H	VV=06H set Smooth to WW
	LFO2 Steps			3FH	05H	VV=07H set Steps to WW
	LFO2 Delay(BPM Sync off)			3FH	05H	VV=11H set Delay to WW
	LFO2 Fadein(BPM Sync off)			3FH	05H	VV=12H set FadeIn to WW
	LFO2 Delay(BPM Sync on)			3FH	05H	VV=21H set Delay to WW
	LFO2 Fadein(BPM Sync on)			3FH	05H	VV=13H set FadeIn to WW
	LFO2 One- Shot			3FH	05H	VV=14H set One-Shot to WW

	LFO2 phase			3FH	31H	VV*128+WW = [0,360]
	LFO2 Rate	73	49	41H	06H	
	LFO2 Rate(BPM Sync on)			43H	06H	[Rhythm List (LFO Rate)]
	LFO2 step1 to step8			3AH	18H-1FH	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
	LFO2 step9 to step64			4AH	40H-77H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
LFO3	LFO3 Gain	75	4B	41H	0DH	
	LFO3 Wave			3FH	06H	VV=00H set Wave to WW
	LFO3 BMP Sync			3FH	06H	VV=01H set BPM Sync to WW
	LFO3 TrigSync			3FH	06H	VV=03H set TrigSync to WW
	LFO3 Smooth			3FH	06H	VV=06H set Smooth to WW
	LFO3 Steps			3FH	06H	VV=07H set Steps to WW
	LFO3 Delay(BPM Sync off)			3FH	06H	VV=11H set Delay to WW
	LFO3 Fadein(BPM Sync off)			3FH	06H	VV=12H set FadeIn to WW
	LFO3 Delay(BPM Sync on)			3FH	06H	VV=21H set Delay to WW
	LFO3 Fadein(BPM Sync on)			3FH	06H	VV=13H set FadeIn to WW
	LFO3 One-Shot			3FH	06H	VV=14H set One-Shot to WW
	LFO3 phase			3FH	32H	VV*128+WW = [0,360]
	LFO3 Rate	76	4C	41H	07H	
	LFO3 Rate(BPM Sync on)			43H	07H	[Rhythm List (ENV LFO)]
	LFO3 step1 to step8			3AH	20H-27H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128

	LFO3 step9 to step64			4BH	00H-37H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
LFO4	LFO4 Gain	77	4D	41H	0EH	
	LFO4 Wave			3FH	07H	VV=00H set Wave to WW
	LFO4 BMP Sync			3FH	07H	VV=01H set BPM Sync to WW
	LFO4 TrigSync			3FH	07H	VV=03H set TrigSync to WW
	LFO4 Smooth			3FH	07H	VV=07H set Smooth to WW
	LFO4 Steps			3FH	07H	VV=07H set Steps to WW
	LFO4 Delay(BPM Sync off)			3FH	07H	VV=11H set Delay to WW
	LFO4 Fadein(BPM Sync off)			3FH	07H	VV=12H set FadeIn to WW
	LFO4 Delay(BPM Sync on)			3FH	07H	VV=21H set Delay to WW
	LFO4 Fadein(BPM Sync on)			3FH	07H	VV=13H set FadeIn to WW
	LFO4 One-Shot			3FH	07H	VV=14H set One-Shot to WW
	LFO4 phase			3FH	33H	VV*128+WW = [0,360]
	LFO4 Rate	78	4E	41H	08H	
	LFO4 Rate(BPM Sync on)			43H	08H	[Rhythm List (LFO Rate)]
	LFO4 step1 to step8			3AH	28H-2FH	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
	LFO4 step9 to step64			4BH	40H-77H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
LFO5	LFO5 Gain	79	4F	41H	0FH	
	LFO5 Wave			3FH	08H	VV=00H set Wave to WW
	LFO5 BMP Sync			3FH	08H	VV=01H set BPM Sync to WW
	LFO5 TrigSync			3FH	08H	VV=03H set TrigSync to WW

	LFO5 Smooth			3FH	08H	VV=08H set Smooth to WW
	LFO5 Steps			3FH	08H	VV=08H set Steps to WW
	LFO5 Delay(BPM Sync off)			3FH	08H	VV=11H set Delay to WW
	LFO5 Fadein(BPM Sync off)			3FH	08H	VV=12H set FadeIn to WW
	LFO5 Delay(BPM Sync on)			3FH	08H	VV=21H set Delay to WW
	LFO5 Fadein(BPM Sync on)			3FH	08H	VV=13H set FadeIn to WW
	LFO5 One-Shot			3FH	08H	VV=14H set One-Shot to WW
	LFO5 phase			3FH	34H	VV*128+WW = [0,360]
	LFO5 Rate	80	50	41H	09H	
	LFO5 Rate(BPM Sync on)			43H	09H	[Rhythm List (LFO Rate)]
	LFO5 step1 to step8			3AH	30H-37H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
	LFO5 step9 to step64			4CH	00H-37H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
ENV1	ENV1 Delay(BPM Sync off)			3FH	00H	VV=08H , BPM Sync off ,set Delay to WW,
	ENV1 Attack(BPM Sync off)	81	51	41H	11H	
	ENV1 Hold(BPM Sync off)			41H	16H	
	ENV1 Decay(BPM Sync off)	82	52	41H	1BH	
	ENV1 Sustain	83	53	41H	20H	
	ENV1 Release(BPM Sync off)	84	54	41H	25H	
	ENV1			3FH	00H	VV=18H , BPM Sync on ,set Delay to WW,

	Sync on)			3FH	00H	VV=18H , BPM Sync on ,set Delay to WW,
	ENV1 Attack(BPM Sync on)			43H	11H	[Rhythm List (ENV LFO)]
	ENV1 Decay(BPM Sync on)			43H	1BH	[Rhythm List (ENV LFO)]
	ENV1 Hold(BPM Sync on)			43H	16H	[Rhythm List (ENV LFO)]
	ENV1 Release(BP M Sync on)			43H	25H	[Rhythm List (ENV LFO)]
	ENV1 AtkCurve			3FH	70H	VV*128+WW = [0,128]
	ENV1 DecCurve			3FH	75H	VV*128+WW = [0,128]
	ENV1 Loop			3FH	00H	VV=06H ,set Env Loop to WW,
	ENV1 Legato			3FH	00H	VV=07H ,set Legato to WW,
	ENV1 BPM Sync			3FH	00H	VV=0CH ,set BPM Sync to WW,
	ENV1 Freerun			3FH	00H	VV=0DH ,set Freerun to WW,
	ENV1 Reset			3FH	00H	VV=0FH ,set Reset to WW,
	ENV1 RelCurve			3FH	7AH	VV*128+WW = [0,128]
	ENV1 TrigSrc1			3AH	60H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LF O5/RbnON/RbnRls/SusPedON/Mod in1/Mod in2
	ENV1 TrigSrc2			3AH	61H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LF O5/RbnON/RbnRls/SusPedON/Mod in1/Mod in2
	ENV1 TrigSrc3			3AH	62H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LF O5/RbnON/RbnRls/SusPedON/Mod in1/Mod in2
	ENV1 TrigSrc4			3AH	63H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LF O5/RbnON/RbnRls/SusPedON/Mod in1/Mod in2
ENV2	ENV2 Delay(BPM Sync off)			3FH	01H	VV=08H , BPM Sync off ,set Delay to WW,
	ENV2 Attack(BPM Sync off)	85	55	41H	12H	

ENV2 Hold(BPM Sync off)			41H	17H	
ENV2 Decay(BPM Sync off)	86	56	41H	1CH	
ENV2 Sustain	87	57	41H	21H	
ENV2 Release(BP M Sync off)	88	58	41H	26H	
ENV2 Delay(BPM Sync on)			3FH	01H	VV=18H , BPM Sync on ,set Delay to WW,
ENV2 Attack(BPM Sync on)			43H	12H	[Rhythm List (ENV LFO)]
ENV2 Decay(BPM Sync on)			43H	1CH	[Rhythm List (ENV LFO)]
ENV2 Hold(BPM Sync on)			43H	17H	[Rhythm List (ENV LFO)]
ENV2 Release(BP M Sync on)			43H	26H	[Rhythm List (ENV LFO)]
ENV2 AtkCurve			3FH	71H	VV*128+WW = [0,128]
ENV2 DecCurve			3FH	76H	VV*128+WW = [0,128]
ENV2 Loop			3FH	01H	VV=06H ,set Env Loop to WW,
ENV2 Legato			3FH	01H	VV=07H ,set Legato to WW,
ENV2 BPM Sync			3FH	01H	VV=0CH ,set BPM Sync to WW,
ENV2 Freerun			3FH	01H	VV=0DH ,set Freerun to WW,
ENV2 Reset			3FH	01H	VV=0FH ,set Reset to WW,
ENV2 RelCurve			3FH	7BH	VV*128+WW = [0,128]
ENV2 TrigSrc1			3AH	64H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LF O5/RbnON/RbnRIs/SusPedON/Mod in1/Mod in2
ENV2 TrigSrc2			3AH	65H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LF O5/RbnON/RbnRIs/SusPedON/Mod in1/Mod in2

	ENV2 TrigSrc3			3AH	66H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LFO5/RbnON/RbnRIs/SusPedON/Mod in1/Mod in2
	ENV2 TrigSrc4			3AH	67H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LFO5/RbnON/RbnRIs/SusPedON/Mod in1/Mod in2
ENV3	ENV3 Delay(BPM Sync off)			3FH	02H	VV=08H , BPM Sync off ,set Delay to WW,
	ENV3 Attack(BPM Sync off)	89	59	41H	13H	
	ENV3 Hold(BPM Sync off)			41H	18H	
	ENV3 Decay(BPM Sync off)	90	5A	41H	1DH	
	ENV3 Sustain	96	60	41H	22H	
	ENV3 Release(BPM Sync off)	97	61	41H	27H	
	ENV3 Delay(BPM Sync on)			3FH	02H	VV=18H , BPM Sync on ,set Delay to WW,
	ENV3 Attack(BPM Sync on)			43H	13H	[Rhythm List (ENV LFO)]
	ENV3 Decay(BPM Sync on)			43H	1DH	[Rhythm List (ENV LFO)]
	ENV3 Hold(BPM Sync on)			43H	18H	[Rhythm List (ENV LFO)]
	ENV3 Release(BPM Sync on)			43H	27H	[Rhythm List (ENV LFO)]
	ENV3 AtkCurve			3FH	72H	VV*128+WW = [0,128]
	ENV3 DecCurve			3FH	77H	VV*128+WW = [0,128]
	ENV3 Loop			3FH	02H	VV=06H ,set Env Loop to WW,
	ENV3 Legato			3FH	02H	VV=07H ,set Legato to WW,
	ENV3 BPM Sync			3FH	02H	VV=0CH ,set BPM Sync to WW,

	ENV3 Freerun			3FH	02H	VV=0DH ,set Freerun to WW,
	ENV3 Reset			3FH	02H	VV=0FH ,set Reset to WW,
	ENV3 RelCurve			3FH	7CH	VV*128+WW = [0,128]
	ENV3 TrigSrc1			3AH	68H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LFO5/RbnON/RbnRls/SusPedON/Mod in1/Mod in2
	ENV3 TrigSrc2			3AH	69H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LFO5/RbnON/RbnRls/SusPedON/Mod in1/Mod in2
	ENV3 TrigSrc3			3AH	6AH	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LFO5/RbnON/RbnRls/SusPedON/Mod in1/Mod in2
	ENV3 TrigSrc4			3AH	6BH	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LFO5/RbnON/RbnRls/SusPedON/Mod in1/Mod in2
ENV4	ENV4 Delay(BPM Sync off)			3FH	03H	VV=08H , BPM Sync off ,set Delay to WW,
	ENV4 Attack(BPM Sync off)	25	19	41H	14H	
	ENV4 Hold(BPM Sync off)			41H	19H	
	ENV4 Decay(BPM Sync off)	27	1B	41H	1EH	
	ENV4 Sustain	125	7D	41H	23H	
	ENV4 Release(BPM Sync off)	124	7C	41H	28H	
	ENV4 Delay(BPM Sync on)			3FH	03H	VV=18H , BPM Sync on ,set Delay to WW,
	ENV4 Attack(BPM Sync on)			43H	14H	[Rhythm List (ENV LFO)]
	ENV4 Decay(BPM Sync on)			43H	1EH	[Rhythm List (ENV LFO)]
	ENV4 Hold(BPM Sync on)			43H	19H	[Rhythm List (ENV LFO)]

	ENV4 Release(BP M Sync on)			43H	28H	[Rhythm List (ENV LFO)]
	ENV4 AtkCurve			3FH	73H	VV*128+WW = [0,128]
	ENV4 DecCurve			3FH	78H	VV*128+WW = [0,128]
	ENV4 Loop			3FH	03H	VV=06H ,set Env Loop to WW,
	ENV4 Legato			3FH	03H	VV=07H ,set Legato to WW,
	ENV4 BPM Sync			3FH	03H	VV=0CH ,set BPM Sync to WW,
	ENV4 Freerun			3FH	03H	VV=0DH ,set Freerun to WW,
	ENV4 Reset			3FH	03H	VV=0FH ,set Reset to WW,
	ENV4 RelCurve			3FH	7DH	VV*128+WW = [0,128]
	ENV4 TrigSrc1			3AH	6CH	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LF O5/RbnON/RbnRls/SusPedON/Mod in1/Mod in2
	ENV4 TrigSrc2			3AH	6DH	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LF O5/RbnON/RbnRls/SusPedON/Mod in1/Mod in2
	ENV4 TrigSrc3			3AH	6EH	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LF O5/RbnON/RbnRls/SusPedON/Mod in1/Mod in2
ENV5	ENV4 TrigSrc4			3AH	6FH	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LF O5/RbnON/RbnRls/SusPedON/Mod in1/Mod in2
	ENV5 Delay(BPM Sync off)			3FH	04H	VV=08H , BPM Sync off ,set Delay to WW,
	ENV5 Attack(BPM Sync off)	102	66	41H	15H	
	ENV5 Hold(BPM Sync off)			41H	1AH	
	ENV5 Decay(BPM Sync off)	103	67	41H	1FH	
	ENV5 Sustain	104	68	41H	24H	
	ENV5	105	69	41H	29H	

	M Sync off)	105	69	41H	29H	
	ENV5 Delay(BPM Sync on)			3FH	04H	VV=18H , BPM Sync on ,set Delay to WW,
	ENV5 Attack(BPM Sync on)			43H	15H	[Rhythm List (ENV LFO)]
	ENV5 Decay(BPM Sync on)			43H	1FH	[Rhythm List (ENV LFO)]
	ENV5 Hold(BPM Sync on)			43H	1AH	[Rhythm List (ENV LFO)]
	ENV5 Release(BPM Sync on)			43H	29H	[Rhythm List (ENV LFO)]
	ENV5 AtkCurve			3FH	74H	VV*128+WW = [0,128]
	ENV5 DecCurve			3FH	79H	VV*128+WW = [0,128]
	ENV5 Loop			3FH	04H	VV=06H ,set Env Loop to WW,
	ENV5 Legato			3FH	04H	VV=07H ,set Legato to WW,
	ENV5 BPM Sync			3FH	04H	VV=0CH ,set BPM Sync to WW,
	ENV5 Freerun			3FH	04H	VV=0DH ,set Freerun to WW,
	ENV5 Reset			3FH	04H	VV=0FH ,set Reset to WW,
	ENV5 RelCurve			3FH	7EH	VV=0FH ,WW = [0,128]
	ENV5 TrigSrc1			3AH	70H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LFO5/RbnON/RbnRIs/SusPedON/Mod in1/Mod in2
	ENV5 TrigSrc2			3AH	71H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LFO5/RbnON/RbnRIs/SusPedON/Mod in1/Mod in2
	ENV5 TrigSrc3			3AH	72H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LFO5/RbnON/RbnRIs/SusPedON/Mod in1/Mod in2
	ENV5 TrigSrc4			3AH	73H	VV*128+WW = [0,11] means OFF/NoteOn/LFO1/LFO2/LFO3/LFO4/LFO5/RbnON/RbnRIs/SusPedON/Mod in1/Mod in2
ARP	ARP Division	106	6A	39H	03H	VV=01H ,WW = [0,11]
	ARP Swing			39H	03H	VV=02H ,WW = [50,75]

	ARP Gate	107	6B	39H	03H	VV=03H ,WW = [5,100]
	ARP Octmode			39H	03H	VV=04H ,WW = [0,4]
	ARP Octave	120	78	39H	03H	VV=05H ,WW = [1,4]
	ARP Mode	108	6C	39H	03H	VV=06H ,WW = [0,7]
	ARP Length	122	7A	39H	03H	VV=07H ,WW = [0,32]
	ARP TapTrig			39H	03H	VV=08H ,WW = [0,1]
	ARP Phrase			39H	03H	VV=09H ,WW = [0,63]
	ARP Ratchet	109	6D	39H	03H	VV=0AH ,WW = [0,127]
	ARP Chance	110	6E	39H	03H	VV=0BH ,WW = [0,100]
Macro	Macro1 Target			3EH	30H-37H	when VV=02H ,set mod target num to WW, when VV=04H ,set mod target num to WW+128, when VV=05H ,set mod target num to WW+256
	Macro1 Btn value1 to value8			3DH	30H-37H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
	Macro1 Depth1 to Depth8			36H	30H-37H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
	Macro2 Target			3EH	38H-3FH	when VV=02H ,set mod target num to WW, when VV=04H ,set mod target num to WW+128, when VV=05H ,set mod target num to WW+256
	Macro2 Btn value1 to value8			3DH	38H-3FH	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
	Macro2 Depth1 to Depth8			36H	38H-3FH	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
	Macro3 Target			3EH	40H-47H	when VV=02H ,set mod target num to WW, when VV=04H ,set mod target num to WW+128, when VV=05H ,set mod target num to WW+256
	Macro3 Btn value1 to value8			3DH	40H-47H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128

Macro3 Depth1 to Depth8			36H	40H- 47H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
Macro4 Target			3EH	48H- 4FH	when VV=02H ,set mod target num to WW, when VV=04H ,set mod target num to WW+128, when VV=05H ,set mod target num to WW+256
Macro4 Btn value1 to value8			3DH	48H- 4FH	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
Macro4 Depth1 to Depth8			36H	48H- 4FH	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
Macro5 Target			3EH	50H- 57H	when VV=02H ,set mod target num to WW, when VV=04H ,set mod target num to WW+128, when VV=05H ,set mod target num to WW+256
Macro5 Btn value1 to value8			3DH	50H- 57H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
Macro5 Depth1 to Depth8			36H	50H- 57H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
Macro6 Target			3EH	58H- 5FH	when VV=02H ,set mod target num to WW, when VV=04H ,set mod target num to WW+128, when VV=05H ,set mod target num to WW+256
Macro6 Btn value1 to value8			3DH	58H- 5FH	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
Macro6 Depth1 to Depth8			36H	58H- 5FH	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
Macro7 Target			3EH	60H- 67H	when VV=02H ,set mod target num to WW, when VV=04H ,set mod target num to WW+128, when VV=05H ,set mod target num to WW+256
Macro7 Btn value1 to value8			3DH	60H- 67H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128

	Macro7 Depth1 to Depth8			36H	60H- 67H	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
	Macro8 Target			3EH	68H- 6FH	when VV=02H ,set mod target num to WW, when VV=04H ,set mod target num to WW+128, when VV=05H ,set mod target num to WW+256
	Macro8 Btn value1 to value8			3DH	68H- 6FH	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
	Macro8 Depth1 to Depth8			36H	68H- 6FH	VV*128+WW = 0 means depth = -128 VV*128+WW = 4096 means depth = 0 VV*128+WW = 8192 means depth = 128
	marco1 panel value	16	10	3FH	58H	VV*128+WW = [0,1024]
	marco2 panel value	17	11	3FH	59H	VV*128+WW = [0,1024]
	marco3 panel value	18	12	3FH	5AH	VV*128+WW = [0,1024]
	marco4 panel value	19	13	3FH	5BH	VV*128+WW = [0,1024]
	marco5 panel value	20	14	3FH	5CH	VV*128+WW = [0,1024]
	marco6 panel value	21	15	3FH	5DH	VV*128+WW = [0,1024]
	marco7 panel value	22	16	3FH	5EH	VV*128+WW = [0,1024]
	marco8 panel value	23	17	3FH	5FH	VV*128+WW = [0,1024]
ModMatrix x	ModMatrix Mod Source			3EH	00H- 1FH	when VV=01H ,set mod sources num to WW, when VV=03H ,set mod sources num to WW+128,
	ModMatrix Mod Target			3EH	00H- 1FH	when VV=02H ,set mod target num to WW, when VV=04H ,set mod target num to WW+128, when VV=05H ,set mod target num to WW+256,
	ModMatrix1 Depth			41H	40H	
	ModMatrix2 Depth			41H	41H	
	ModMatrix3 Depth			41H	42H	

ModMatrix4 Depth			41H	43H	
ModMatrix5 Depth			41H	44H	
ModMatrix6 Depth			41H	45H	
ModMatrix7 Depth			41H	46H	
ModMatrix8 Depth			41H	47H	
ModMatrix9 Depth			41H	48H	
ModMatrix10 Depth			41H	49H	
ModMatrix11 Depth			41H	4AH	
ModMatrix12 Depth			41H	4BH	
ModMatrix13 Depth			41H	4CH	
ModMatrix14 Depth			41H	4DH	
ModMatrix15 Depth			41H	4EH	
ModMatrix16 Depth			41H	4FH	
ModMatrix17 Depth			41H	50H	
ModMatrix18 Depth			41H	51H	
ModMatrix19 Depth			41H	52H	
ModMatrix20 Depth			41H	53H	
ModMatrix21 Depth			41H	54H	
ModMatrix22 Depth			41H	55H	
ModMatrix23 Depth			41H	56H	
ModMatrix24 Depth			41H	57H	
ModMatrix25 Depth			41H	58H	
ModMatrix26			41H	59H	

	Depth					
	ModMatrix27 Depth			41H	5AH	
	ModMatrix28 Depth			41H	5BH	
	ModMatrix29 Depth			41H	5CH	
	ModMatrix30 Depth			41H	5DH	
	ModMatrix31 Depth			41H	5EH	
	ModMatrix32 Depth			41H	5FH	
Ribbon	Ribbon Mode			3FH	3BH	VV=00H ,Control mode of ribbon strip.
	Key Span			3FH	3BH	VV=01H ,Key span for entire ribbon strip
	Octave			3FH	3BH	VV=02H ,Shift octave
	quantize			3FH	3BH	VV=03H ,Quantize to scale
	ModControl			3FH	3BH	VV=10H ,Toggle for volume control of Mod Wheel to Theremin
	Glide			3FH	3BH	VV=11H ,Amount of glide
Voice	Detune	95	5F	3FH	39H	VV*128+WW = [0,127]
	StWidth	117	75	3FH	44H	VV*128+WW = [0,127]
	Vib Amt			3FH	43H	VV*128+WW = [0,12]
	AnalogFL			3FH	46H	VV*128+WW = [0,127]
	Density			3FH	3CH	VV*128+WW = [1,8]
	GlidCurv			3FH	14H	VV*128+WW = [0,128] means [Log(-64), Lin(0), Exp(64)]
	Glide	66	42	3FH	12H	VV*128+WW = [0,1] means OFF / ON
	GlidLgto			3FH	1FH	VV*128+WW = [0,1] means OFF / ON
	GlidTime	5	5	3FH	15H	VV*128+WW = [0, 127]
	StMode			3FH	48H	VV*128+WW = [0,2]
	Polyphny			3FH	13H	VV*128+WW = [0,1] means OFF / ON
	PitchBnd			3FH	41H	VV*128+WW = [0,24]
	Vib Rate(BPM Sync off)			3FH	42H	VV*128+WW = [0,127]
	Vib Rate(BPM Sync on)			3FH	3FH	[Rhythm List (Vibrato)]
	RdmPhase			3FH	1EH	VV*128+WW = [0,1] means OFF / ON



	WarmMode			3FH	4FH	VV*128+WW = [0,1] means OFF / ON
	Vib BPM			3FH	49H	VV*128+WW = [0,1] means OFF / ON
Global	All notes off			3FH	4EH	VV*128+WW = [0,16383]
	All notes off and effect silence			3FH	57H	VV*128+WW = [0,16383]
	Bank select MSB	0	0			VV = [0,127]
	Modulation wheel.	1	1			VV = [0,127]
	Expression pedal	11	0B			VV = [0,127]
	Bank select LSB	32	20			VV = [0,127]
	Sustain pedal	64	40			VV = [0,127]
	All notes off	123	7B			VV = [0,127]
	Master Volume	7	7			VV = [0,127]
System	CVSource			3FH	4CH	VV*128+WW = [0,1]
	Fade in for aftertouch			3FH	3EH	VV*128+WW = [0,400]
	Delay for aftertouch			3FH	3DH	VV*128+WW = [0,400]
	OverFlow			3FH	4BH	VV*128+WW = [0,1]
	release for aftertouch			3FH	4DH	VV*128+WW = [0,400]
		100	64			
		101	65			
		121	79			
		6	6			
		38	26			
		98	62			
		99	63			

RHYTHM LISTS

1/1 1/2 1/4 1/8 1/16 1/32 1/1T 1/2T 1/4T 1/8T 1/16T 1/32T

ARP

1/4 1/8 1/16 1/32 1/1T 1/2T 1/4T 1/8T 1/16T 1/32T 1/1Dot 1/2Dot 1/4Dot 1/8Dot 1/16Dot 1/32Dot



Vibrato
0 1/64T 1/64 1/32T 1/64Dot 1/32 1/16T 1/32Dot 1/16 1/8T 1/16Dot 1/8 1/4T 1/8Dot 1/4 1/2T 1/4Dot 1/2 1/1T 1/2Dot 1/1 1/1Dot 8' 12' 16' 24' 32' 64'
ENV LFO
64' 32' 24' 16' 12' 8' 1/1Dot 1/1 1/2Dot 1/1T 1/2 1/4Dot 1/2T 1/4 1/8Dot 1/4T 1/8 1/16Dot 1/8T 1/16 1/32Dot 1/16T 1/32 1/64Dot 1/32T 1/64 1/64T
LFO Rate
1/64T 1/64 1/32T 1/64Dot 1/32 1/16T 1/32Dot 1/16 1/8T 1/16Dot 1/8 1/4T 1/8Dot 1/4 1/2T 1/4Dot 1/2 1/1T 1/2Dot 1/1 1/1Dot
FX Delay



MIDI CC mapping Sorted by Module

Module	Parameter	CC
Amp	Amp LFO2amt	62
ARP	ARP Division	106
ARP	ARP Gate	107
ARP	ARP Mode	108
ARP	ARP Ratchet	109
ARP	ARP Chance	110
ARP	ARP Octave	120
ARP	ARP Length	122
Delay	Delay Feedback	14
Delay	Delay Time	15
Delay	Delay Wet tone	63
Delay	Delay Dry/Wet	92
ENV 1	ENV1 Attack	81
ENV 1	ENV1 Decay	82
ENV 1	ENV1 Sustain	83
ENV 1	ENV1 Release	84
ENV 2	ENV2 Attack	85
ENV 2	ENV2 Decay	86
ENV 2	ENV2 Sustain	87
ENV 2	ENV2 Release	88
ENV 3	ENV3 Attack	89
ENV 3	ENV3 Decay	90
ENV 3	ENV3 Sustain	96
ENV 3	ENV3 Release	97
ENV 4	ENV4 Attack	25
ENV 4	ENV4 Decay	27
ENV 4	ENV4 Release	124
ENV 4	ENV4 Sustain	125

ENV 5	ENV5 Attack	102
ENV 5	ENV5 Decay	103
ENV 5	ENV5 Sustain	104
ENV 5	ENV5 Release	105
Filter 1	Filter 1 Drive	50
Filter 1	Filter 1 Keytrack	51
Filter 1	Filter 1 LFO1amt	52
Filter 1	Filter 1 Vel Env	53
Filter 1	Filter 1 ENV1amt	54
Filter 1	Filter 1 Res	71
Filter 1	Filter 1 Cutoff	74
Filter 2	Filter 2 Cutoff	55
Filter 2	Filter 2 Res	56
Filter 2	Filter 2 Type	57
Filter 2	Filter 2 Keytrack	58
Filter 2	Filter 2 LFO1amt	59
Filter 2	Filter 2 Vel Env	60
Filter 2	Filter 2 ENV1amt	61
LFO 1	LFO1 Gain	70
LFO 1	LFO1 Rate	72
LFO 2	LFO2 Gain	28
LFO 2	LFO2 Rate	73
LFO 3	LFO3 Gain	75
LFO 3	LFO3 Rate	76
LFO 4	LFO4 Gain	77
LFO 4	LFO4 Rate	78
LFO 5	LFO5 Gain	79
LFO 5	LFO5 Rate	80
Macros	Macro 1	16
Macros	Macro 2	17
Macros	Macro 3	18
Macros	Macro 4	19
Macros	Macro 5	20



Macros	Macro 6	21
Macros	Macro 7	22
Macros	Macro 8	23
Mixer	Noise Vol	03
Mixer	Noise Pan	08
Mixer	Ring Mod Vol	09
Mixer	Ring Mod Pan	10
Mixer	RM12 Depth	43
Mixer	OSC1 Vol	44
Mixer	OSC1 Pan	45
Mixer	OSC2 Vol	46
Mixer	OSC2 Pan	47
Mixer	OSC3 Vol	48
Mixer	OSC3 Pan	49
Mixer	OSC 3 FRate	114
Mixer	Noise FRate	115
Mixer	Ring Mod FRate	116
Mixer	OSC1 FRate	118
Mixer	OSC2 FRate	119
Mutator 1	Mutator1 Ratio	29
Mutator 1	Mutator1 Depth	30
Mutator 1	Mutator1 Dry/Wet	31
Mutator 2	Mutator2 Ratio	33
Mutator 2	Mutator2 Depth	34
Mutator 2	Mutator2 Dry/Wet	35
Mutator 3	Mutator3 Ratio	36
Mutator 3	Mutator3 Depth	37
Mutator 3	Mutator3 Dry/Wet	39

Mutator 4	Mutator4 Ratio	40
Mutator 4	Mutator4 Depth	41
Mutator 4	Mutator4 Dry/Wet	42
OSC 1	OSC1 wavscan	24
OSC 1	OSC 1 Cent	111
OSC 2	OSC2 WavScan	26
OSC 2	OSC 2 Cent	112
OSC 3	OSC 3 Cent	113
Post-fx	POST-FX Param1	68
Post-fx	POST-FX Param2	69
Post-fx	POST FX Mix	94
Pre-fx	PRE-FX Param1	12
Pre-fx	PRE-FX Param2	13
Pre-fx	PRE-FX Mix	93
Reverb	Reverb Time	65
Reverb	Reverb Tone	67
Reverb	Reverb Dry/Wet	91
System	Bank select MSB	00
System	Modulation wheel.	01
System	Master Volume	07
System	Expression pedal	11
System	Bank select LSB	32
System	Sustain pedal	64
System	All notes off	123
Voice	GlidTime	05
Voice	Glide	66
Voice	Detune	95
Voice	StWidth	117



MIDI CC mapping sorted by CC number

Module	Parameter	CC
System	Bank select MSB	00
System	Modulation wheel.	01
Mixer	Noise Vol	03
Voice	GlidTime	05
System	Master Volume	07
Mixer	Noise Pan	08
Mixer	Ring Mod Vol	09
Mixer	Ring Mod Pan	10
System	Expression pedal	11
Pre-fx	PRE-FX Param1	12
Pre-fx	PRE-FX Param2	13
Delay	Delay Feedback	14
Delay	Delay Time	15
Macros	Macro 1	16
Macros	Macro 2	17
Macros	Macro 3	18
Macros	Macro 4	19
Macros	Macro 5	20
Macros	Macro 6	21
Macros	Macro 7	22
Macros	Macro 8	23
OSC 1	OSC1 wavscan	24
ENV 4	ENV4 Attack	25
OSC 2	OSC2 WavScan	26
ENV 4	ENV4 Decay	27
LFO 2	LFO2 Gain	28
Mutator 1	Mutator1 Ratio	29
Mutator 1	Mutator1 Depth	30
Mutator 1	Mutator1 Dry/Wet	31
System	Bank select LSB	32
Mutator 2	Mutator2 Ratio	33
Mutator 2	Mutator2 Depth	34
Mutator 2	Mutator2 Dry/Wet	35
Mutator 3	Mutator3 Ratio	36

Mutator 3	Mutator3 Depth	37
Mutator 3	Mutator3 Dry/Wet	39
Mutator 4	Mutator4 Ratio	40
Mutator 4	Mutator4 Depth	41
Mutator 4	Mutator4 Dry/Wet	42
Mixer	RM12 Depth	43
Mixer	OSC1 Vol	44
Mixer	OSC1 Pan	45
Mixer	OSC2 Vol	46
Mixer	OSC2 Pan	47
Mixer	OSC3 Vol	48
Mixer	OSC3 Pan	49
Filter 1	Filter1 Drive	50
Filter 1	Filter1 Keytrack	51
Filter 1	Filter1 LFO1amt	52
Filter 1	Filter1 Vel Env	53
Filter 1	Filter1 ENV1amt	54
Filter 2	Flt2 Cutoff	55
Filter 2	Flt2 Res	56
Filter 2	Flt2 Type	57
Filter 2	Filter2 Keytrack	58
Filter 2	Filter2 LFO1amt	59
Filter 2	Filter2 Vel Env	60
Filter 2	Filter2 ENV1amt	61
Amp	Amp LFO2amt	62
Delay	Delay Wet tone	63
System	Sustain pedal	64
Reverb	Reverb Time	65
Voice	Glide	66
Reverb	Reverb Tone	67
Post-fx	POST-FX Param1	68
Post-fx	POST-FX Param2	69
LFO 1	LFO1 Gain	70
Filter 1	Filter1 Res	71
LFO 1	LFO1 Rate	72
LFO 2	LFO2 Rate	73
Filter 1	Filter1 Cutoff	74
LFO 3	LFO3 Gain	75



LFO 3	LFO3 Rate	76
LFO 4	LFO4 Gain	77
LFO 4	LFO4 Rate	78
LFO 5	LFO5 Gain	79
LFO 5	LFO5 Rate	80
ENV 1	ENV1 Attack	81
ENV 1	ENV1 Decay	82
ENV 1	ENV1 Sustain	83
ENV 1	ENV1 Release	84
ENV 2	ENV2 Attack	85
ENV 2	ENV2 Decay	86
ENV 2	ENV2 Sustain	87
ENV 2	ENV2 Release	88
ENV 3	ENV3 Attack	89
ENV 3	ENV3 Decay	90
Reverb	Reverb Dry/Wet	91
Delay	Delay Dry/Wet	92
Pre-fx	PRE-FX Mix	93
Post-fx	POST FX Mix	94
Voice	Detune	95
ENV 3	ENV3 Sustain	96
ENV 3	ENV3 Release	97
ENV 5	ENV5 Attack	102
ENV 5	ENV5 Decay	103
ENV 5	ENV5 Sustain	104
ENV 5	ENV5 Release	105
ARP	ARP Division	106
ARP	ARP Gate	107
ARP	ARP Mode	108
ARP	ARP Ratchet	109
ARP	ARP Chance	110
OSC 1	OSC1 Cent	111
OSC 2	OSC2 Cent	112
OSC 3	OSC3 Cent	113
Mixer	OSC3 FRate	114
Mixer	Noise FRate	115
Mixer	RM12 FRate	116
Voice	StWidth	117

Mixer	OSC1 FRate	118
Mixer	OSC2 FRate	119
ARP	ARP Octave	120
ARP	ARP Length	122
System	All notes off	123
ENV 4	ENV4 Release	124
ENV 4	ENV4 Sustain	125